

WHAT IS CLAIMED IS:

1. A control device for a turbocharger with an electric motor, comprising:
 - a turbocharger which is provided along with an internal combustion engine and supercharges air taken in the internal combustion engine using a compressor;
 - 5 an electric motor which can increase a supercharging pressure by running the compressor of the turbocharger; and
 - 10 a controller which calculates a base amount of electric power to be supplied to the electric motor based on a target supercharging pressure and an actual supercharging pressure; decides an amount of electric power to be supplied to the electric motor; controls the electric motor based on the decided amount of electric power to be supplied; and sets the amount of electric power to be supplied to a maximum amount of electric power in a beginning state of an electric power supply to the electric motor, regardless of the calculated base amount of electric power.
- 15 2. The control device for a turbocharger with an electric motor according to claim 1, wherein the controller stops making the amount of electric power to be supplied the maximum amount of electric power, when the actual supercharging pressure exceeds the target supercharging pressure after the maximum amount of electric power is supplied to the electric motor.
- 20 3. The control device for a turbocharger with an electric motor according to claim 2, wherein the controller stops making the amount of electric power to be supplied the maximum amount of electric power, and then, as the amount of electric power gradually falls from the maximum amount, progressively makes that gradually decreasing amount of electric power the amount of power to be supplied.
- 25 4. The control device for a turbocharger with an electric motor according to claim 3, wherein the controller sets the amount of electric power to be supplied to the base amount of electric power, when the actual supercharging pressure becomes equal to or lower than the target supercharging pressure while the amount of electric power is being gradually decreased.

5. A control device for a turbocharger with an electric motor, comprising:

10 a turbocharger which is provided along with an internal combustion engine and supercharges air taken in the internal combustion engine using a compressor;

15 an electric motor which can increase a supercharging pressure by running the compressor of the turbocharger; and

20 a controller which detects an output power required of the internal combustion engine; calculates a base amount of electric power to be supplied to the electric motor based on a target supercharging pressure and an actual supercharging pressure; decides an amount of electric power to be supplied to the electric motor; controls the electric motor based on the decided amount of electric power to be supplied; and sets the amount of electric power to be supplied to a maximum amount of electric power in a state where the detected value is equal to or higher than a predetermined value, regardless of the calculated base amount of electric power.

25 6. The control device for a turbocharger with an electric motor according to claim 5, wherein the detected value includes at least an accelerator opening change amount, a battery voltage, and a temperature of the electric motor.

30 7. The control device for a turbocharger with an electric motor according to claim 5, wherein the controller stops making the amount of electric power to be supplied the maximum amount of electric power, when the actual supercharging pressure exceeds the target supercharging pressure after the maximum amount of electric power is supplied to the electric motor.

35 8. The control device for a turbocharger with an electric motor according to claim 7, wherein the controller stops making the amount of electric power to be supplied the maximum amount of electric power, and then, as the amount of electric power gradually falls from the maximum amount, progressively makes that gradually decreasing amount of electric power the amount of electric power to be supplied.

9. The control device for a turbocharger with an electric motor according to claim 8, wherein the controller sets the amount of electric power to be supplied to the base amount of electric power, when the actual supercharging pressure becomes equal to or lower than the target supercharging pressure while the amount of electric power is being gradually decreased.

10. A control method of a control device for a turbocharger with an electric motor including a turbocharger which is provided along with an internal combustion engine and supercharges air taken in the internal combustion engine using a compressor; and an electric motor which can increase a supercharging pressure by running the compressor of the turbocharger, comprising the steps of:

calculating a base amount of electric power to be supplied to the electric motor based on a target supercharging pressure and an actual supercharging pressure;

15 deciding an amount of electric power to be supplied to the electric motor;

controlling the electric motor based on the decided amount of electric power to be supplied; and

20 setting the amount of electric power to be supplied to a maximum amount of electric power in a beginning state of an electric power supply to the electric motor regardless of the calculated base amount of electric power.

11. The control method according to claim 10, further comprising the step of:

25 stopping making the amount of electric power to be supplied the maximum amount of electric power, when the actual supercharging pressure exceeds the target supercharging pressure after the maximum amount of electric power is supplied to the electric motor.

30 12. The control method according to claim 11, further comprising the step of:

stopping making the amount of electric power to be supplied the maximum amount of electric power, and then, as the amount of electric power gradually falls from the maximum amount, progressively making that gradually decreasing amount of electric power the amount of electric power to be supplied.

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13. The control method according to claim 12, further comprising the step of:

10 setting the amount of electric power to be supplied to the base amount of electric power, when the actual supercharging pressure becomes equal to or lower than the target supercharging pressure while the amount of electric power is being gradually decreased.

15 14. A control method of a control device for a turbocharger with an electric motor including a turbocharger which is provided along with an internal combustion engine and supercharges air taken in the internal combustion engine using a compressor; and an electric motor which can increase a supercharging pressure by running the compressor of the turbocharger, comprising the steps of:

20 detecting an output power required of the internal combustion engine; calculating a base amount of electric power to be supplied to the electric motor based on a target supercharging pressure and an actual supercharging pressure;

deciding an amount of electric power to be supplied to the electric motor;

25 controlling the electric motor based on the decided amount of electric power to be supplied; and

setting the amount of electric power to be supplied to a maximum amount of electric power in a state where the detected value is equal to or higher than a predetermined value regardless of the calculated base amount of electric power.

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15. The control method according to claim 14, wherein the detected value includes at least an accelerator opening change amount, a battery voltage, and a temperature of the electric motor.

5 16. The control method according to claim 14, further comprising the step of:

10 stopping making the amount of electric power to be supplied the maximum amount of electric power, when the actual supercharging pressure exceeds the target supercharging pressure after the maximum amount of electric power is supplied to the electric motor.

17. The control method according to claim 16, further comprising the step of:

15 stopping making the amount of electric power to be supplied the maximum amount of electric power, and then, as the amount of electric power gradually falls from the maximum amount, progressively making that gradually decreasing amount of electric power the amount of electric power to be supplied.

20 18. The control method according to claim 17, further comprising the step of:

setting the amount of electric power to be supplied to the base amount of electric power, when the actual supercharging pressure becomes equal to or lower than the target supercharging pressure while the amount of electric power is being gradually decreased.